Operation Manual

iMars B

Series Grid-tied Solar Inverter

SHENZHEN INVT ELECTRIC CO., LTD.

Preface

Thank you for purchasing iMars B series grid-tied solar inverters.

iMars B series grid-tied solar inverters is mainly used in solar photovoltaic grid system. As a non-isolation and high-efficiency string photovoltaic grid-tied inverter, it transfers DC energy generated by solar modules to sinusoidal AC energy and feedback to public grid. The energy has the same frequency and phase with the utility grid.

The manual is intended to provide detailed information of installation, application, trouble shooting, precautions and maintenance of iMars B series grid-tied solar inverters. Please read this manual carefully and follow all safety precautions seriously before any moving, installation, operation and maintenance to ensure correct use and high performance of operation on the inverter.

Configured monitoring and design software for iMars B series grid-tied solar inverters are also provided. Go to www.invt-solar.com and download the software installation package and use instructions.

The inverter complies with local regulations and laws on grid feeding.

The manual needs to be kept well and be available at all times.

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1 Safety precautions

This chapter describes various warning symbols in the operation manual of iMars series inverters. It is intended to provide the installers and the users with all safety information about installation, operation, and use of the inverter.

1.1 Icons

This manual provides relevant information with icons to highlight the physical and property safety of the user to avoid device damage and physical injury.

The icons used in this manual are listed below:

Icons	Name	Instruction	Abbreviation
Danger	Danger	Serious physical injury or even death may occur if not follow the relative requirements	
Warning	Warning	Physical injury or damage to the devices may occur if not follow the relative requirements	
Do not	Do not	Damage may occur if not follow the relative requirements	
Hot sides	Hot sides	Sides of the device may become hot. Do not touch.	
Note	Note	Physical hurt may occur if not follow the relative requirements	Note

1.2 Safety guidelines

	● The first thing after receiving is to check for any visible damage to the package or to the inverter. If there is something suspected, contact the shipping company and local dealer before installing. ● Only qualified electricians are allowed to operate on the inverter. ● Do not carry out any wiring and inspection or changing components when the power supply is applied. Ensure all power supplies are disconnected before wiring and checking and always wait for at least 5 minutes.
	● Ensure that there is no electromagnetic interference from other electrical and electronic equipments on the installation site. ● Do not refit the inverter unauthorized. ● All the electric installation needs to be compliance with the national or local laws and standards.
	● The temperature of individual parts or the enclosure of the inverter–especially the heat sink may become hot in normal operation. There is a danger of burning. Do not touch.

	● Do not open the cover of inverters unauthorizedly. The electrical parts and components inside the inverter are electrostatic. Take measurements to avoid electrostatic discharge during relevant operation.

1.2.1 Delivery and installation

	● Keep the package and unit complete, dry and clean during storage and delivery. ● Please remove and install the inverter with two or more people, because of the inverter is heavy. ● Remove and install the inverter with appropriate tools to ensure safe and normal operation and avoid physical injury or death. The people also need mechanical protective measures, such as protective shoes and work clothes. ● Only qualified electricians are allowed to install the inverter. ● Do not put and install the inverter on or close to combustible materials. ● Keep the installation site away from children and other public places. ● Remove the metal jewelry such as ring and bracelet before installation and electrical connection to avoid electric shock. ● Do cover solar modules with light-tight materials. Exposed to sunlight, solar modules will output dangerous voltage. ● Max. input voltage of iMars BG1K5TL / BG2K2TL / BG3KTL does not exceed 500V; Max. input voltage of iMars BG4KTL / BG5KTL / BG6KTL does not exceed 550V; Max. input voltage of iMars BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR does not exceed 1000V; otherwise inverter damage may occur. ● The positive and negative pole of solar modules can not be grounded, otherwise irrecoverable damage may occur. ● Ensure the proper grounding of the inverter, otherwise, improper connection or no grounding may cause stop of the inverter. ● Ensure reliable installation and electrical connection.

Note: iMars B series grid-tied solar inverters are only for crystalline silicon solar modules.

1.2.2 Grid-tied operation

	● Only qualified electricians are allowed to operate the inverter under the permission of local power departments. ● Ensure reliable installation and electrical connection before operation. ● Do not open the cover of inverter during operation or voltage is present.

1.2.3 Maintenance and inspection

	● Only qualified electricians are allowed to perform the maintenance, inspection, and components replacement of the inverter. ● Contact with the local dealer or supplier for maintenance. ● Firstly disconnect all power supplies of the grid to the inverter before any maintenance, and then disconnect the breakers and wait for at least 5 minutes until the inverter is discharged before maintenance. ● Please follow electrostatic protection norms and take correct protective measures because of the electrostatic sensitive circuits and devices in the inverter. ● Do not use parts and components not provided by our company during maintenance.。 ● Restart the inverter after settling the fault and problem which may affect the safety and performance of the inverter. ● Do not get close to or touch any metal conductive part of the grid or inverter, otherwise electric shock, physical injury or death and fire may occur. Please do not ignore the warning icons and instructions with “electric shock”.

1.2.4 What to do after scrapping

	● Deal with the inverter as industrial effluent.

2 Product overview

This chapter mainly describes the appearance, packaging accessories, name plate, technical parameters and other information of iMars B series grid-tied solar inverters.

2.1 Solar grid-tied power generation system

The photovoltaic grid-tied power generation system consists of solar modules, grid-tied inverter, metering devices and public grid.

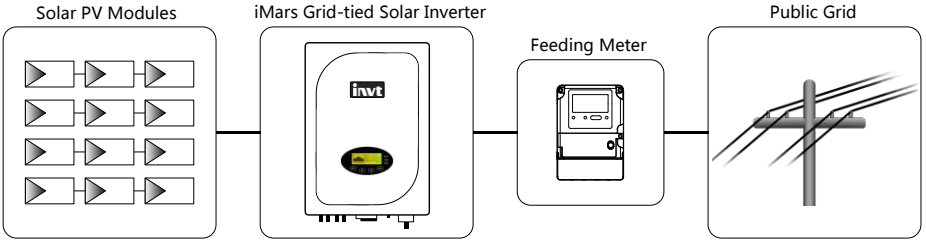


Figure 2.1 Application of iMars grid-tied solar inverters

Grid-tied solar inverter is the core of photovoltaic power generation system. The solar energy can be converted into DC electric energy through solar modules and then be changed into sinusoidal AC energy which has the same frequency and phase with the public grid by grid-tied solar inverters, and then be feeded into the grid.

iMars B series grid-tied solar inverters are only applied in solar grid-tied power generation system and its DC input are only composed of crystalline silicon solar modules whose negative and positive poles are not grounded. Do not connect any AC loads between the inverter and breakers which is shown as the figure below:

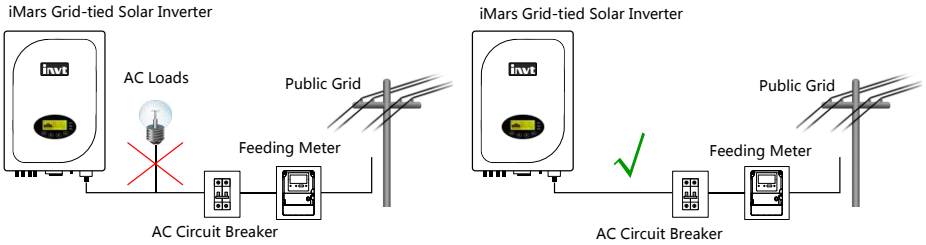


Figure 2.2 Connection of inverters and AC breakers

	● The recommended solar modules need to comply with IEC61730 Class A rating.

2.2 Products appearance

2.2.1 Single-phase inverters

Figure 2.3 and 2.4 are the internal circuit structure diagrams of iMars B series grid-tied solar inverters. The inverter has 1 DC switch(for the on-off of DC input), 1 invertering circuit of DC/AC single-phase, 1 AC grid-tied interface of single-phase, 1 “RS485” communication port, 1 “EXT” communication port and an operational panel with LCD display and buttons.

iMars 1.5 ~ 3kW Solar Inverter Topology

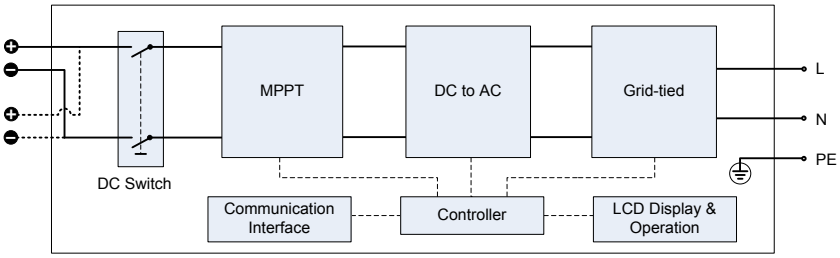


Figure 2.3 Internal circuit diagrams of iMars BG1K5TL / BG2K2TL / BG3KTL inverters

In figure 2.3, the iMars BG1K5TL / BG2K2TL / BG3KTL inverter has 1 MPPT, of which, the inverter of BG1K5TL / BG2K2TL can support the connection of 1 string of solar modules and the inverter of BG3KTL can support 2 strings of solar modules.

iMars 4~6kW Solar Inverter Topology

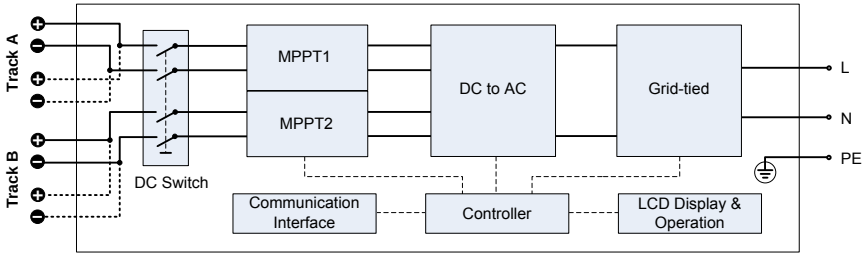


Figure 2.4 Internal circuit diagrams of iMars BG4KTL / BG5KTL / BG6KTL inverters

In figure 2.4, the iMars BG4KTL / BG5KTL / BG6KTL inverter has 2 MPPT respectively for two DC input area of Track A and Track B. And the inverter can support the connection of 4 strings of solar modules at the most.

Below is the structure of iMars BG1K5TL / BG2K2TL / BG3KTL / BG4KTL / BG5KTL / BG6KTL inverters:

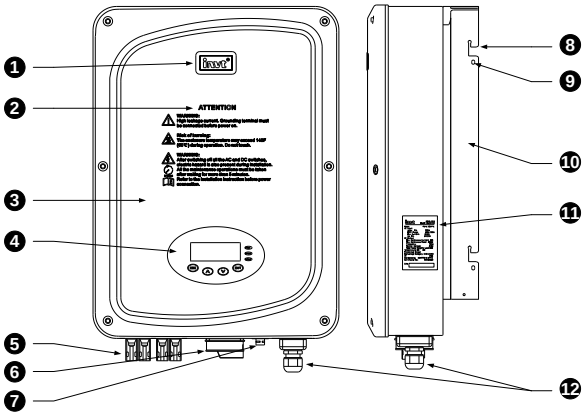


Figure 2.5 Products appearance of single-phase inverters

Table 2-1 Parts instruction of single-phase inverters

No.	Name	Instruction
1	Company logo	INVT
2	Safety precautions	
3	Cover	
4	Operational panel	LED indicators, LCD screen and buttons
5	DC input port	For the connection of solar modules
6	DC switch	On –off of the DC input
7	Communication port	RS485 and EXT communication port
8	Installation groove	For the connection of inverter and installation bracket
9	Screw holes	To fasten the inverter on the installation bracket
10	Radiator	
11	Name plate	For rated parameters of the inverter
12	AC terminal	For the connection of AC output

2.2.2 Three-phase inverters

Figure 2.6 is the internal circuit structure diagrams of iMars B series three-phase grid-tied solar inverters. The inverter has 1 DC switch(for the on-off of DC input), 1 invertering circuit of DC/AC three-phase, 1 AC grid-tied interface of three-phase, 1 “RS485” communication port, 1 “EXT” communication port and an operational panel with LCD display and buttons. And the inverter has 2

MPPT respectively for two DC input area of Track A and Track B. Of which, the inverter of BG6KTR / BG8KTR can support the connection of 4 string of solar modules and the inverter of BG10KTR / BG12KTR / BG15KTR can support the connection of 6 string of solar modules.

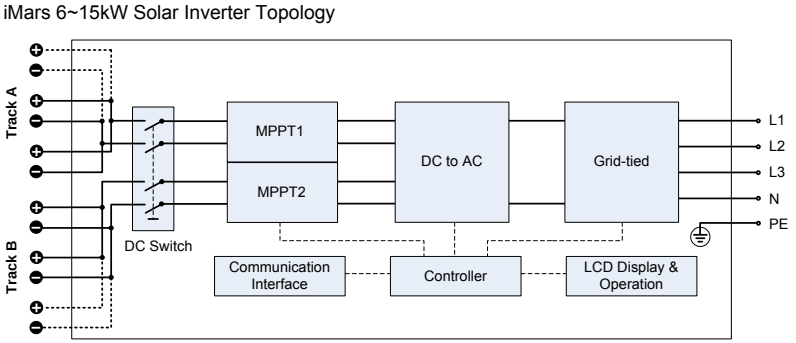


Figure 2.6 Internal circuit diagrams of iMars BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR inverters

Below is the structure of iMars BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR inverters:

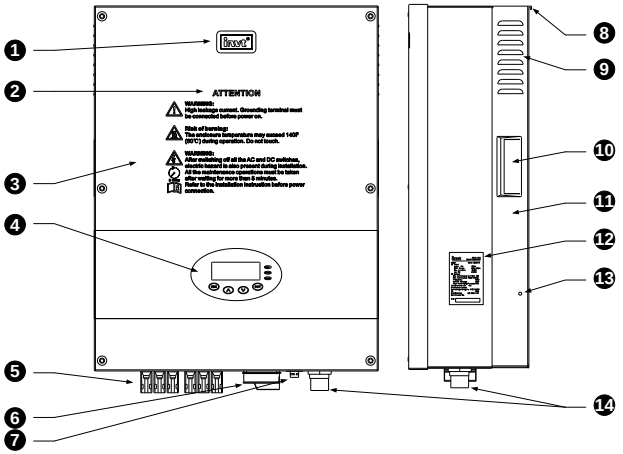


Figure 2.7 Products appearance of three-phase inverters

Table 2-2 Parts instruction of three-phase inverters

No.	Name	Instruction
1	Company logo	INVT
2	Safety precautions	
3	Cover	

No.	Name	Instruction
4	Operational panel	LED indicators, LCD screen and buttons
5	DC input port	For the connection of solar modules
6	DC switch	On –off of the DC input
7	Communication port	RS485 and EXT communication port
8	Installation hanger	For the connection of inverter and installation bracket
9	Air duct	For ventilation
10	Concave handle	Foe removing and carrying
11	Cooling chamber	Protect the radiator and fan
12	Name plate	For rated parameters of the inverter
13	Screw holes	To fasten the inverter on the installation bracket
14	AC terminal	For the connection of AC output

2.3 Name plates

There is name plate on the inverter and package. After receiving, please check the information of name plates are the ordered one. If not, please contact with the supplier as soon as possible.

2.3.1 Name plate on the package

The information on the name plate of the package includes the inverter model, DC input parameters, and AC output parameters, operation temperature, protective degree, gross weight, certificate No., grid No., origin country, environmental logo, certification logo and brand information and so on.

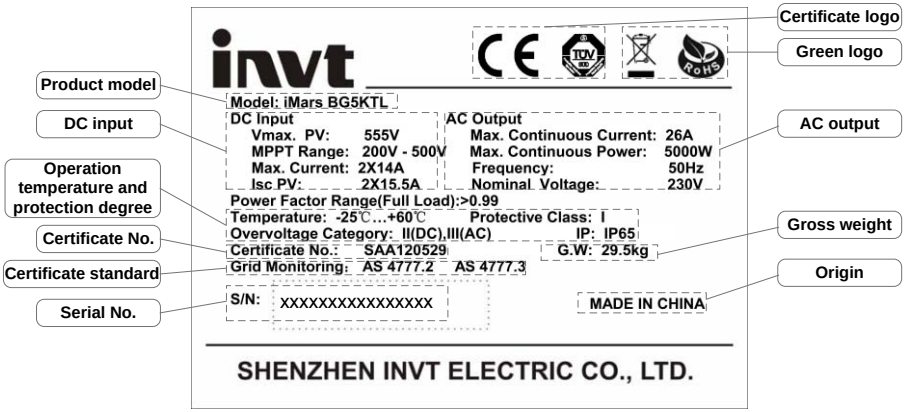


Figure 2.8 Name plate on the package

2.3.2 Name plate on the inverter

The information on the name plate of the inverter includes the brand information, product name, product model, DC input parameters, AC output parameters, operation temperature, protective degree, gross weight, grid certificate standard, certificate No., certification logo, environmental logo, and serial No. of the product and so on.

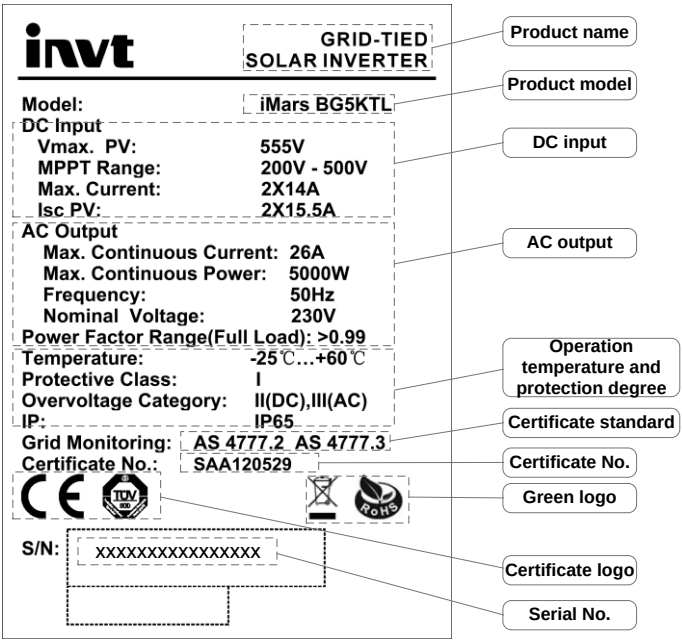


Figure 2.9 Name plate on the inverter

2.3.3 Models

Table 2-3 Models of iMars B series grid-tied solar inverters

Product name	Model	Rated output power (W)
Single-phase (L, N, PE)		
Single-phase grid-tied solar inverters	iMars BG1K5TL	1500
Single-phase grid-tied solar inverters	iMars BG2K2TL	2200
Single-phase grid-tied solar inverters	iMars BG3KTL	3000
Single-phase grid-tied solar inverters	iMars BG4KTL	4000

Product name	Model	Rated output power (W)
Single-phase grid-tied solar inverters	iMars BG5KTL	5000
Single-phase grid-tied solar inverters	iMars BG6KTL	6000
Three-phase (L1, L2, L3, N, PE)		
Three-phase grid-tied solar inverters	iMars BG6KTR	6000
Three-phase grid-tied solar inverters	iMars BG8KTR	8000
Three-phase grid-tied solar inverters	iMars BG10KTR	10000
Three-phase grid-tied solar inverters	iMars BG12KTR	12000
Three-phase grid-tied solar inverters	iMars BG15KTR	15000

Note: Refer to the product specifications in section 2.4 of iMars B series grid-tied solar inverters for detailed information.

2.4 Technical parameters

Table 2-4 Technical parameters of iMars B series grid-tied solar inverters

Model		Single-phase						Three-phase				
		BG1K5TL	BG2K2TL	BG3KTL	BG4KTL	BG5KTL	BG6KTL	BG6KTR	BG8KTR	BG10KTR	BG12KTR	BG15KTR
DC input	Max. DC voltage	500	500	500	550	550	550	1000	1000	1000	1000	1000
	Starting voltage (V)	100	100	100	100	100	100	200	200	200	200	200
	MPPT voltage(V)	180-450	180-450	200-450	200-500	200-500	200-500	250-800	250-800	250-800	250-800	250-800
	Operation voltage (V)	200-450	200-450	210-450	200-500	200-500	200-500	250-800	250-800	250 - 800	300 - 800	380 - 800
	MPPT/string of each MPPT	1/1	1/1	1/2	2/1	2/1	2/2	2/2	2/2	2/3	2/3	2/3
	Max. DC power (W)	1800	2500	3250	4300	5300	6250	6400	8400	10400	12500	15600
	Max. input current (A)	8x1	11x1	15x1	12x2	14x2	16x2	16x2	21x2	21x2	21x2	21x2
	DC switch	Optional			Optional (Lockable-off)			Integrated (Lockable-off)				
AC output	Rated output power (W)	1500	2200	3000	4000	5000	6000	6000	8000	10000	12000	15000
	AC voltage(V)/ frequency(Hz)	180~270 / 47~51.5						320~460 / 47~51.5				
	Max. AC output current (A)	7.5	11	15	20	26	29	10	13	15	20	24
	Power factor	>0.99(full load)						-0.9~+0.9(adjustable)				
	Harmonic distortion	< 3%										
System	Cooling	Natural cooling					Air cooling					
	Maximum efficiency	96.90%	97.20%	97.30%	97.40%	97.60%	97.60%	97.50%	97.80%	98.00%	98.00%	98.00%
	European efficiency	96.00%	96.10%	96.30%	96.50%	96.50%	96.50%	97.00%	97.00%	97.50%	97.50%	97.50%
	MPPT efficiency	99.9%										
	Protection degree	IP65										
	Power consumption at night	< 1W										
	Isolation mode	Transformerless										
	Operation temperature	-25℃～+60℃, derate after 45℃										
	Relative humidity	0~95%, no condensation										
	Max. altitude(m)	1000 (derate if the altitude＞1000)										
	Displaying	LCD										
	LCD language	English, Chinese										
	Standard communication	RS485										
	Optional communication	WiFi, Ethernet										
	DC terminal	SUNCLIX water-proof terminal										
	Noise dB(A)	≤25					<52					
	Installation mode	Wall installation										
Protection	Overvoltage protection, DC isolation monitoring, DC monitoring, island protection, short circuit protection, overtemperature protection											

2.5 Dimensions and weight

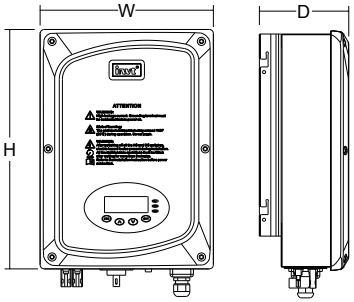


Figure 2.10 Internal dimensions of BG1K5TL/ BG2K2TL/ BG3KTL inverters

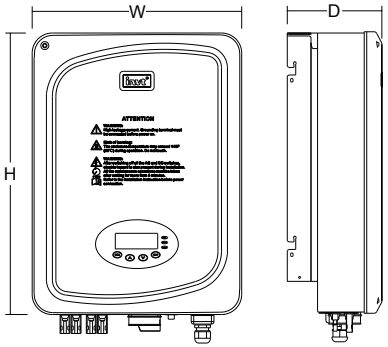


Figure 2.11 Internal dimensions of BG4KTL/ BG5KTL/ BG6KTL inverters

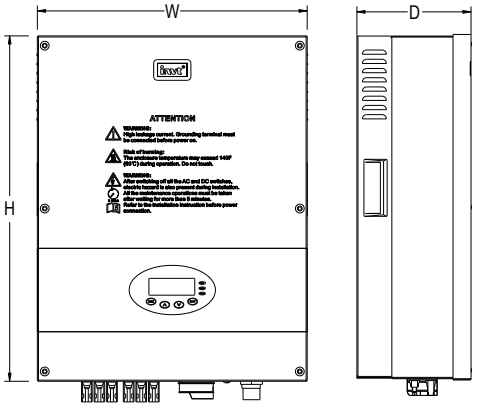


Figure 2.12 Internal dimensions of BG6KTR/ BG8KTR/ BG10KTR/ BG12KTR/ BG15KTR inverters

Table 2-5 Inverters dimension and net weight

Model	H (mm)	W (mm)	D (mm)	Net weight (kg)
BG1K5TL / BG2K2TL / BG3KTL	460	335	175	16.5
BG4KTL / BG5KTL / BG6KTL	560	415	190	25.5
BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR	656	494	215	35

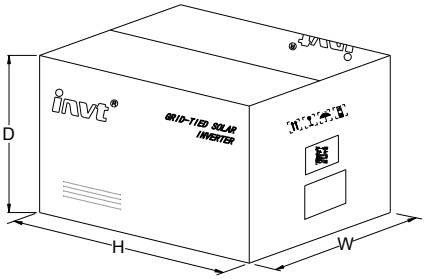


Figure 2.13 Packages dimension

Table 2-6 Packages dimension and gross weight

Model	H (mm)	W (mm)	D (mm)	Gross weight (kg)
BG1K5TL / BG2K2TL / BG3KTL	645	440	300	19.5
BG4KTL / BG5KTL / BG6KTL	780	550	320	29.5
BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR	825	620	350	41.5

3 Installation

This chapter describes how to install the inverter and connect it to the grid-tied solar system (including the connection between solar modules, public grid and inverter).

Read this chapter carefully and ensure all installation requirements are met before installation. Only qualified electricians are allowed to install the inverter.

3.1 Unpacking inspection

Inspect the information of the order and the name plate to ensure the product are the ordered one and no damage to the package. If any problem, contact the supplier as soon as possible.

Put the inverter into the package if not used and protect it from humidity and dust.

Check as following after unpacking:

(1) Ensure no damage to the inverter unit;

(2) Ensure the operation manual, port and installation accessories in the package;

(3) Ensure no damage or loss to the items in the package;

(4) Ensure the information of the order are the same as that of the name plate;

(5) The delivery list of single-phase inverters is different from that of three-phase inverters.

Below are the detailed lists:

List of BG1K5TL / BG2K2TL / BG3KTL / BG4KTL / BG5KTL / BG6KTL inverters:

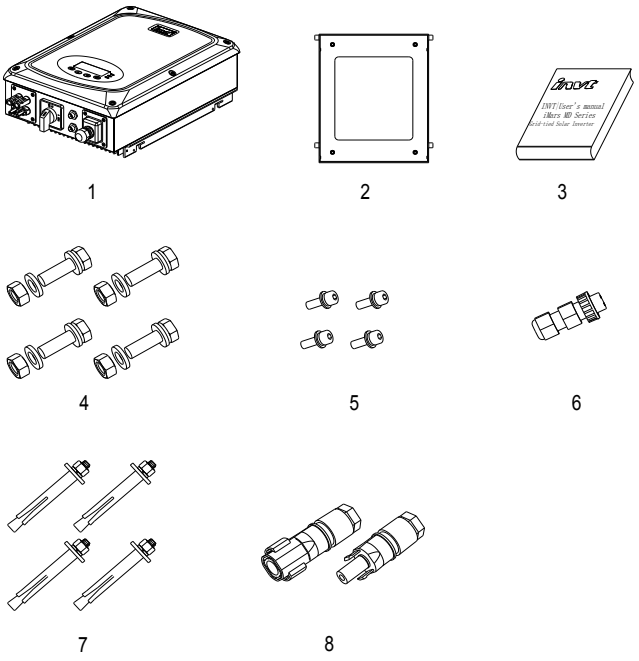


Figure 3.1 Packing list of single-phase inverters

Table 3-1 Detailed delivery list

No.	Name	Quantity
1	BG1K5TL / BG2K2TL / BG3KTL / BG4KTL / BG5KTL / BG6KTL inverters	1
2	Installation bracket	1
3	Operation manual of iMars B series	1
4	Hexagon assembling bolt M6*20	4
5	Screws M4*20	4
6	Communication connector	1
7	Expansion bolts M6*50	4
8	DC connector	BG1K5TL / BG2K2TL:1 pair BG3KTL:2 pairs BG4KTL / BG5KTL:2 pairs BG6KTL:4 pairs

List of BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR inverters:

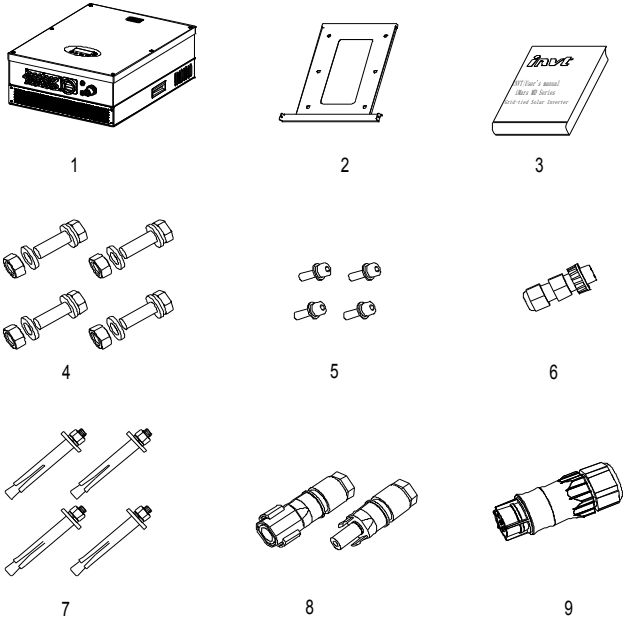


Figure 3.2 Packing list of three-phase inverters

Table 3-2 Detailed delivery list

No.	Name	Quantity
1	BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR inverters	1
2	Installation bracket	1
3	Operation manual of iMars B	1
4	Hexagon assembling bolt M6*20	6
5	Screws M4*12	2
6	Communication connector	1
7	Expansion bolts M6*50	6
8	DC connector	BG6KTR / BG8KTR: 4 pairs BG10KTR / BG12KTR / BG15KTR: 6 pairs
9	AC connector	1

Please check as the mentioned above. If any problem, contact the supplier as soon as possible.

3.2 Before installation

3.2.1 Installation tools

Table 3-3 Tools list

No.	Installation tools	Instruction
1	Marking pen	Mark the installation hole
2	Electrodrill	Drill in the bracket or wall
3	Hammer	Hammer on the expansion bolts
4	Monkey wrench	Fix the installation bracket
5	Allen driver	Fasten the screws, remove and install AC wiring box
6	Straight screwdriver	For AC wiring
7	Megger	Measuring insulation performance and impedance
8	Multimeter	Check the circuit and AC and DC voltage
9	Electric iron	Weld communications cable

3.2.2 Installation place

Select installation place based on the following considerations:

(1) Height from ground level should be enough to ensure that display and status LEDs are easy to read.
(2) Select a well ventilated place sheltered from direct sun radiation and rain.
(3) Allow sufficient space around the inverter to enable easy installation and removal from the mounting surface. Refer to Figure 3.3.
(4) The environment temperature is between -25℃~60℃.
(5) The installation position keeps away from the interface of other electrical devise.
(6) The inverter needs to be installed on a firm and sturdy surface, such as wall and metal bracket and so on.
(7) The installation surface should be perpendicular to the horizontal line. Refer to Figure 3.4.

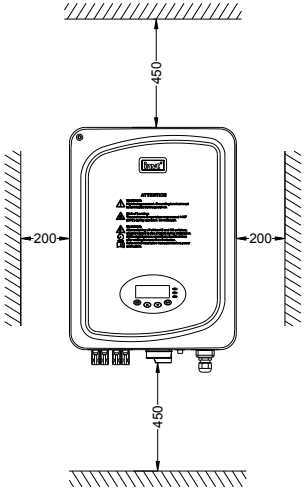


Figure 3.3 Installation space

Ensure there is sufficient space for heat-releasing. In generally, below space requirement should be met:

Table 3-4 Detailed installation space

	Minimum clearance
Lateral	200mm
Top	450mm
Bottom	450mm

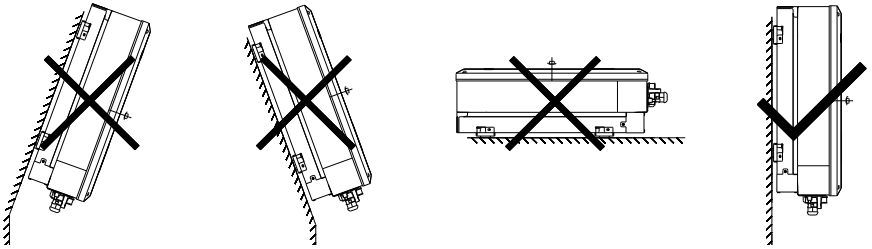


Figure 3.4 Installation position

	● Do not remove any part and component of the inverter unintended; otherwise damage to the device and physical injury may occur.

3.2.3 Connection cables

The user can select connection cable according the table below:

Table 3-5 Cable specifications

Model	DC side		AC side
	Cross-section (length ≤50m) mm^2	Cross-section (length >50m) mm^2	Mini cross-section mm^2
BG1K5TL	4	4	4
BG2K2TL	4	4	4
BG3KTL	4	4	4
BG4KTL	4	6	6
BG5KTL	4	6	6
BG6KTL	4	6	6
BG6KTR	4	6	4
BG8KTR	4	6	4
BG10KTR	4	6	6
BG12KTR	4	6	6
BG15KTR	4	6	6

3.2.4 Miniature circuit breakers

It is recommended strongly to install circuit breakers or fuses at the DC input and AC output to ensure safe installation and running.

Table 3-6 Breakers specifications

Model	DC input	AC output
	Recommended DC breakers (optional for length >100m)	Recommended AC breakers
BG1K5TL	DC500V, C10A, 2P	AC240V, C10A, 2P
BG2K2TL	DC500V, C16A, 2P	AC240V, C16A, 2P
BG3KTL	DC500V, C16A, 2P	AC240V, C20A, 2P
BG4KTL	DC550V, C16A, 2P	AC240V, C25A, 2P
BG5KTL	DC550V, C16A, 2P	AC240V, C32A, 2P
BG6KTL	DC550V, C16A, 2P	AC240V, C32A, 2P
BG6KTR	DC1000V, C20A, 2P	AC400V, C16A, 4P
BG8KTR	DC1000V, C20A, 2P	AC400V, C16A, 4P
BG10KTR	DC1000V, C20A, 2P	AC400V, C20A, 4P
BG12KTR	DC1000V, C20A, 2P	AC400V, C25A, 4P
BG15KTR	DC1000V, C20A, 2P	AC400V, C32A, 4P

3.3 Mechanical installation

Since the installation place can be made by different construction materials, the inverter can be installed by different mounting methods. Take the typical installation environment as the example, the manual describes how to install the inverter on concrete wall. And because of different structure, the single-phase and three-phase inverters have different instillation modes.

The inverter should be mounted in a vertical position of 90°to the horizontal line as shown in figure 3.4.

3.3.1 Installation of single-phase inverters

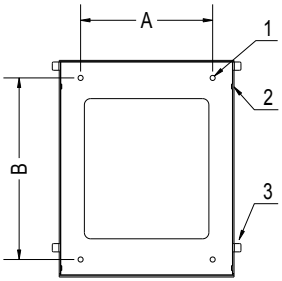


Figure 3.5 Installation bracket of single-phase inverters

Table 3-7 Size of installation bracket

Model	Installation hole	
	A(mm)	B(mm)
BG1K5TL / BG2K2TL / BG3KTL	210	285
BG4KTL / BG5KTL / BG6KTL	296	349

Table 3-8 Instruction of installation bracket

No.	Structure instruction
1	Installation holeΦ6
2	Screw hole M4
3	Installation hanger

Installation steps of single-phase inverters:

(1) Put the installation bracket against the wall and mark the position of 4 installation holes;

(2) Drill in the wall according to the marked holes position;

(3) Fix the expansion bolts into the 4 holes with hammer;

(4) Fix the installation bracket on the bolts and ensure it is firm enough as figure 3.6 shows;

(5) Hang the inverter on the installation bracket and ensure it is locked-in as figure 3.6 shows;

(6) Fix the screws into the screw-holes to ensure fastened installation.

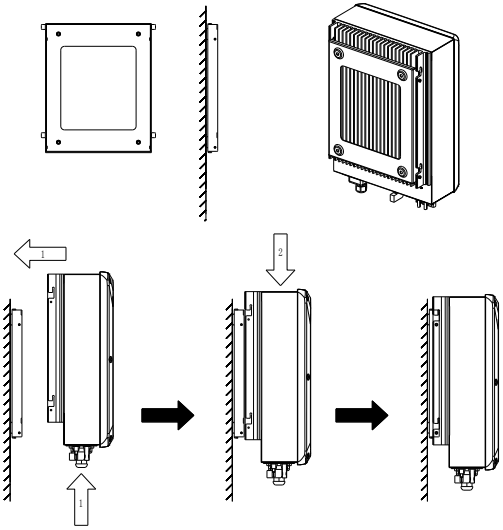


Figure 3.6 Installation of single-phase inverters

3.3.2 Installation of three-phase inverters

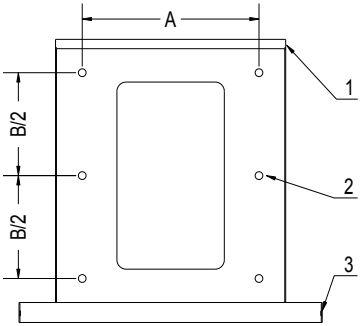


Figure 3.7 Installation bracket of three-phase inverters

Table 3-9 Instruction of installation bracket

Model	Installation hole	
	A(mm)	B/2(mm)
BG6KTR / BG8KTR BG10KTR / BG12KTR / BG15KTR	288	165

Table 3-10 Instruction of installation bracket

No.	Structure instruction
1	Installation hanger
2	Installation holeΦ6
3	Screw hole M4

Installation steps of three-phase inverters:

(1) Put the installation bracket against the wall and mark the position of 6 installation holes;

(2) Drill in the wall according to the marked holes position;

(3) Fix the expansion bolts into the 6 holes with hammer;

(4) Fix the installation bracket on the bolts and ensure it is firm enough as figure 3.8 shows;

(5) Hang the inverter on the installation bracket and ensure it is locked-in as figure 3.8 shows;

(6) Fix the screws into the screw-holes to ensure fastened installation.

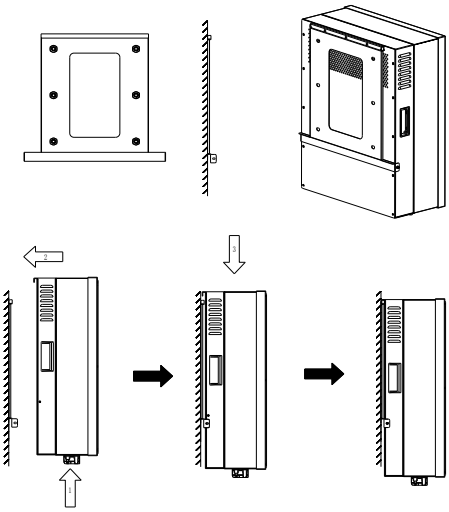


Figure 3.8 Installation of three-phase inverters

3.4 Electrical installation

This section proposes to describe detailed electrical installation and related safety instructions.

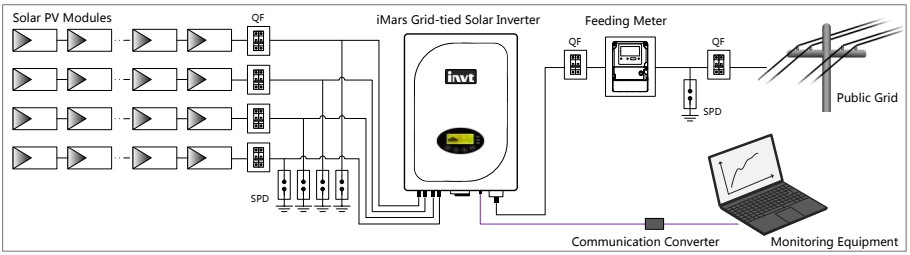


Figure 3.9 Block diagram of the grid-tied solar system

⚠	● Improper operation during the wiring process can cause fatal injury to operator or unrecoverable damage to the inverter. Only qualified personnel can perform the wiring work. ● All electrical installations must be in accordance with local and national electrical codes. ● All cables must be firmly attached, undamaged, properly insulated and adequately dimensioned.

Note	● Read and follow the instructions provided in this section while observing all safety warnings. ● Always note the rated voltage and current defined in this manual. Never exceed the limits.

The external ports are at the bottom of the inverter which is shown as figure 3.10, figure 3.11 and figure 3.12.

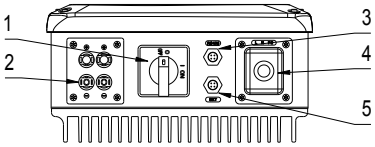


Figure 3.10 External ports of BG1K5TL / BG2K2TL / BG3KTL inverters

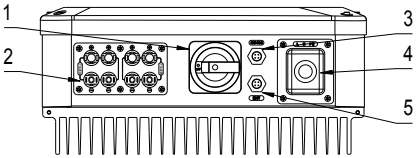


Figure 3.11 External ports of BG4KTL / BG5KTL / BG6KTL inverters

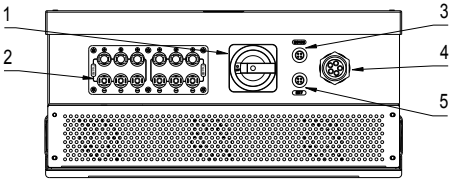


Figure 3.12 External ports of BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR inverters

Table 3-11 Port instruction

No.	External ports	Instruction
1	DC switch	BG1K5TL / BG2K2TL / BG3KTL: On-off of DC input ; BG4KTL / BG5KTL / BG6KTL / BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR: On-off of DC input
2	DC input terminal	BG1K5TL / BG2K2TL: 1-string input BG3KTL / BG4KTL / BG5KTL: 2-string input BG6KTL / BG6KTR / BG8KTR: 4-string input

No.	External ports	Instruction
		BG10KTR / BG12KTR / BG15KTR: 6-string input
3	RS485 communication terminal	Standard RS485 port
4	AC output port	Single-phase inverters: AC wiring box Three-phase inverters: pluggable wiring terminal
5	EXT communication terminal	Optional

3.4.1 Connection of solar modules

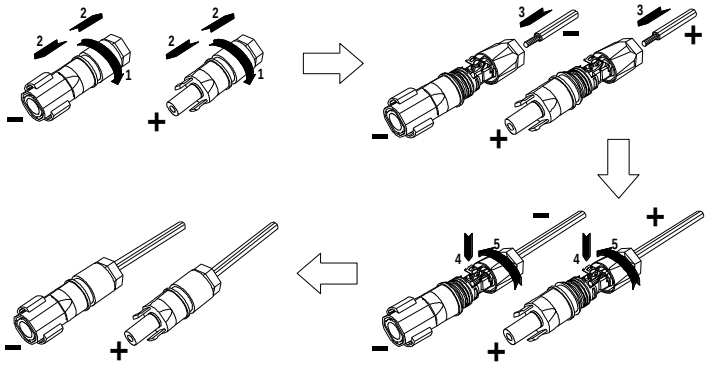


Figure 3.13 Connection between DC connector and solar modules

Connection steps:

(1) Lighting, short-circuit and other protection measures which meet the local electrical safety laws and regulations are needed before the AC connection;

⚠	● Only qualified cables under the local electrical safety laws and regulations are allowed to connect.

(2) Connect the output cables of solar modules to the DC connector as figure 3.13 shows. Loose the nut of connector and remove the isolation layer of the DC cable for about 15mm. Insert it into the connector and press until heart the lock sound. Finally fasten the nut. The wiring of negative pole is the same as that of the positive pole. Ensure the poles of solar modules are well connected with the connectors;

⚠	● The solar modules connected with the inverter needs to be the configured ones other than some connecting devices without authorized. Otherwise, device damage, unstable operation or fire may occur.

(3) Connect the DC connector with the inverter and ensure tightly-fastened;

(4) Insert the screw-driver into the hole of the connector to remove the connector form the inverter.

(5) Unclench the pressed cover with screw-driver to remove the cables from the connector.

3.4.2 AC connection of single-phase inverters

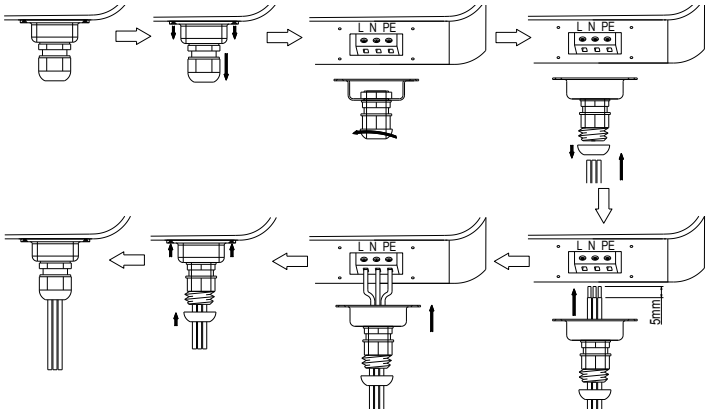


Figure 3.14 AC connection of single-phase inverters

Connection steps of single-phase inverters:

(1) Lighting, short-circuit and other protection measures which meet the local electrical safety laws and regulations are needed before the AC connection;

⚠	● Only qualified cables under the local electrical safety laws and regulations are allowed to connect.

(2) Connect the cable of L, N and PE to the AC port according to figure 3.14. Ensure the cables are not exposed and fastened and the AC wiring box is locked.

3.4.3 AC connection of three-phase inverters

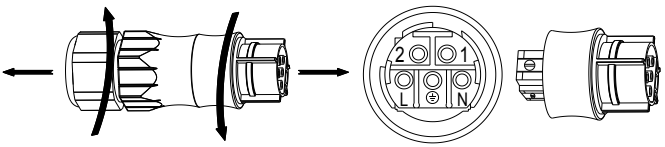


Figure 3.15 Three-phase AC connector

Table 3-12 Port instruction of three-phase AC connector

AC connector	Three-phase	Remark
1	L1 (A)	
2	L2 (B)	
L	L3 (C)	
N	N neutral wire	Connect
⏚	PE grounding wire	Connect

- The AC connector needs to correspond to the grid phase seriously. AC connector “1, 2 and L” corresponds to the “A phase, B phase and C phase” of the public grid.

Connection steps of three-phase inverters:

(1) Lighting, short-circuit and other protection measures which meet the local electrical safety laws and regulations are needed before the AC connection;

- Only qualified cables under the local electrical safety laws and regulations are allowed to connect.

(2) Remove the AC connector as figure 3.15 shows;

(3) Connect the AC connector to cables as figure 3.16 shows. Ensure the cables and connectors are corresponded and fastened.

(4) Connect the connector to the AC port of the inverter as figure 3.16 shows.

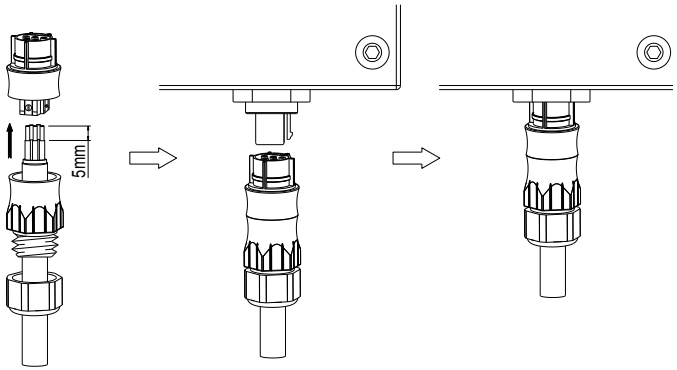


Figure 3.16 AC connection of three-phase inverters

4 Operation

This chapter describes detailed operation of the inverter which involves the inspection before operation, grid-tied operation, stopping and daily maintenance of the inverter.

4.1 Inspection before operation

Check as follows before operation (including but not limited to):

(1) Ensure the installation site meet the requirement mentioned in section 3.2.2 for easy installation, removing, operation and maintenance;

(2) Ensure the mechanical installation meet the requirement mentioned in section 3.4;

(3) Ensure the electrical installation meet the requirement mentioned in section 3.5;

(4) Ensure all switches are “off”;

(5) Ensure the voltage meet the requirement mentioned in section 2.4;

(6) Ensure all electrical safety precautions are clearly-identified on the installation site.

- Do check as above before any operation if the system or inverter needs to be installed, refitted and maintained.

4.2 Grid-tied operation

Please start the inverter as follows:

(1) Ensure the requirements mentioned in section 4.1 are met;

(2) Switch on the breakers at the AC side;

(3) Switch on the integrated DC switch;

(4) Switch on the switch on the DC side;

(5) Observe the LED indicators and information displayed on the screen. Refer to chapter 5 for detailed information.

Run Green indicator blinks, others off: the inverter is power on and in self-inspection;

Run Green indicator on, others off: the inverter is in power generation after self-inspection----successful commissioning.

“Warn” or “Fault” indicators are on or blinking: the inverter is power on, but fault occurs. Please refer to section 5.3 for detailed information, and then stop as the section 4.3 mentioned, finally settle the problems as chapter 7. If all faults are solved, do as chapter 4 mentioned.

(6) Refer t o section 5.4.4 to set the inverter time according to local time.

(7) The default DC input mode of iMars B series grid-tied solar inverters is “independent”. Please refer to section 5.4.4 for injury and detailed setting.

Note	● Keep the inverter power on at least 30 minutes after time setting if the inverter operates at the first time. Charge for the internal clock battery to ensure normal operation.

4.3 Stopping

Stop the inverter as follows it needs maintenance, inspection and troubleshooting:

(1) Switch off the breakers at the AC side;

(2) Switch off the integrated DC switch;

(3) Switch off the switch on the DC side;

(4) Wait at least 5 minutes until the internal parts and components are discharged. And then stop the inverter.

4.4 Daily maintenance

The inverter can perform power generation, start and stop automatically even the day and night shifts and seasons change in one year. In order to prolong the service life, daily maintenance and inspection are needed besides following the instructions mentioned in this manual seriously.

It is necessary to check the wiring of external interface of inverters regularly to ensure no loosing occurs, especially the fan, communication terminals, DC input terminals, and AC output terminals and grounding.

Do not start the inverter after alarm-stopping. It is necessary to find the fault causes and perform troubleshooting as section 4.1 mentioned before restarting.

Only qualified electricians are allowed to operate the inverter. Do as chapter 5 and 7 mentioned. If any problems, please record the detailed fault and contact the supplier as soon as possible.

5 Display panel

This chapter describes the panel displaying and how to operate on the panel, which involves the LCD display, LED indicators and operation panel.

The operation state and parameters can be attained from the LED indicators and LCD display. The displayed content and parameters can also be set or modified by the operation panel.

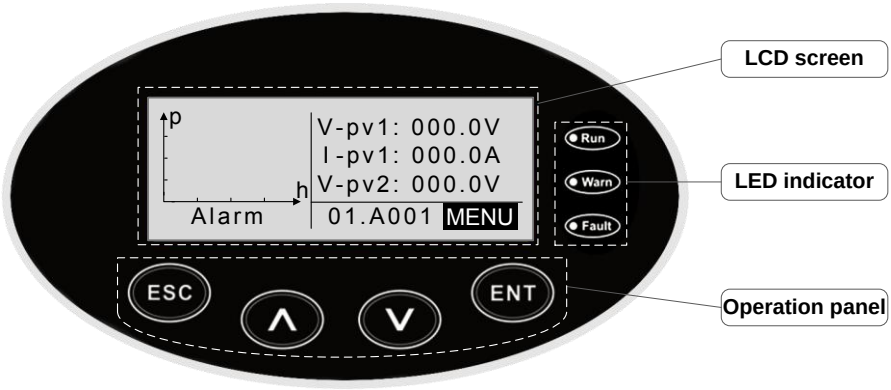


Figure 5.1 Operation panel

5.1 LED indicators

There are three LED indicators on the panel:

(1) “Run”, operation indicator, green;

(2) “Warn” recoverable fault indicator, yellow;

(3) “Fault”, unrecoverable fault indicator, red.

The inverter state includes 6 states of stand-by, self-inspection, power generation, recoverable fault and unrecoverable fault; LED indicators are on, off and blinking. Please refer to table 5-1 for detailed state of inverters and LED indicators state.

“○”: LED indicator is off;

“◐” (green), “◐” (yellow), “◐” (red): LED indicator is blinking at every 0.25S or 0.5S;

“●(Green), “●” (yellow), “●” (red): LED indicator is on.

Table 5-1 Inverters state and LED indicators

Inverters state	LED indicators	Description
Stand-by	○ Run ○ Warn ○ Fault	No power on. All indicators off.
Self-inspection	◐ Run ○ Warn ○ Fault	Green indicator blinks in every 0.25s, others off. Power on and ready for self-inspection
Power generation	● Run ○ Warn ○ Fault	Green indicator keeps on, others off. Grid-tied power generation.
	● Run ● Warn ○ Fault	(1) Grid-tied power generation, but clock fault (A007); (2) Grid-tied power generation, but DC input fault (A001 or E001); (3) Grid-tied power generation，but fan fault(E006 or E012); Green and yellow indicator keeps on, others off.
Recoverable fault	○ Run ◐ Warn ○ Fault	Inverter stand-by. The public grid fault(A001, A003, A004, A005or A006); Yellow indicator blinks in every 0.5s, others off
	○ Run ● Warn ○ Fault	(1) Inverter stand-by. Temperature abnormal(E006); (2) Inverter stand-by. DC input fault (E001); Yellow indicator keeps on, others off
Unrecoverable fault	○ Run ○ Warn ◐ Fault	Hardware or software fault (E003, E004, E005, E008, E009, E011, E013 or E015). De-couple the inverter from the system before maintenance. Red indicator blinks in every 0.5s, others off
	○ Run ○ Warn ● Fault	Current-leakage or unqualified output power energy of the inverter (E007, E010, E014, E017, E018 or E020). De-couple the inverter from the system before maintenance. Red indicator keeps on, others off
Artificial turned off	● Run ● Warn ● Fault	Stop after the communication or panel command. All indicators are on.
Note	Please refer to chapter 5 and 7 for detailed fault information and troubleshooting.	

5.2 Operation panel

There are 4 buttons on the panel:

(1) “ESC”, exit and escape;

(2) “∧”, back to the front page and data decreasing;

(3) “∨”， to the next page and data increasing;

(4) “ENT”, enter.

5.3 LCD screen

All information is displayed on the LCD screen. The background illumination of LCD screen will go out to save power if there is not button operation in 15 seconds. But it can be activated by pressing any button. Press “ENT” to enter into the main interface if the background illumination is on. All parameters can be viewed and set on the interface.

There are main interface and menu interfaces on the LCD screen, of which the main interface is the default one after power on, while the menu interfaces are used to watch and set parameters or other manual operation, such as viewing the monitoring parameters, history record, system information, statistics and fault information and setting the displayed language, time, communication address, password and factory defaults.

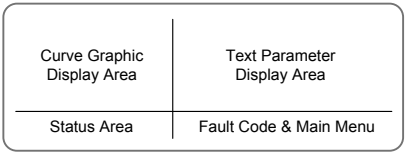


Figure 5.2 Main interface

The main interface of the LCD screen is shown as the figure above:

(1) The curve displays the power changing at the current day;

(2) The words on the screen display the current key parameters of the inverter. Three lines of words are displayed at a time, but if the inverter is in operation or stand-by state, the words are rolling forward at every 3s. And the user can press “∧” or “∨” to look up the information freely;

(3) 5 states of the inverter are displayed on the screen;

(4) If the inverter is in fault or warning state, up to 8 corresponding fault codes can be displaying on the screen.

5.4 Functions operation

Most of the parameters can be viewed and set through the LCD screen and operation panel.

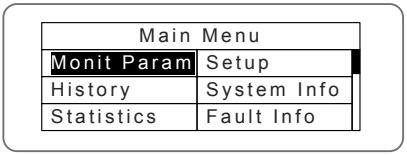


Figure 5.3 Main interface

5.4.1 Monitoring parameters

Press "∧" and "∨" in the main interface to select "Monit Param", and then press "ENT" to view the parameters which is shown in figure 5.4. Go the front or next page through "∧" and "∨" and return through "ESC".

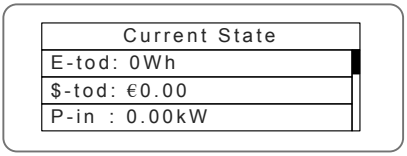


Figure 5.4 Monitoring parameters

Different inverters have different parameters. "●" in table 5-2 means the monitoring parameters of the inverter can be displayed on the LCD screen.

Table 5-2 Monitoring parameters

Monitoring content	BG1K5TL/BG2K2TL/ BG3KTL	BG4KTL/BG5KTL/ BG6KTL	BG6KTR/BG8KTR/ BG10KTR/BG12KTR/ BG15KTR
Total power produced this day	●	●	●
Total power saved this day	●	●	●
Input power	●	●	●
Output power	●	●	●
Peak power	●	●	●
Grid voltage (U)	●	●	●
Grid voltage V			●
Grid voltage W			●

Monitoring content	BG1K5TL/BG2K2TL/ BG3KTL	BG4KTL/BG5KTL/ BG6KTL	BG6KTR/BG8KTR/ BG10KTR/BG12KTR/ BG15KTR
Grid current (U)	●	●	●
Grid current V			●
Grid current W			●
Grid frequency	●	●	●
Power factor	●	●	●
Input V (V1)	●	●	●
Input I (I1)	●	●	●
Input V2		●	●
Input I2		●	●
Grounding resistor	●	●	●
Leakage current	●	●	●
Temperature 1	●	●	●
Temperature 2	●	●	●
Total power consumption	●	●	●
Total time	●	●	●
Current date	●	●	●
Current time	●	●	●

5.4.2 History

Press "∧" and "∨" in the main interface to select "History", and then press "ENT" to view the parameters which is shown in figure 5.5.

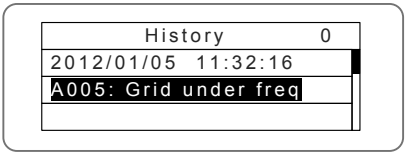


Figure 5.5 History parameters

There are 32 history records in total. Press "∧" and "∨" to review the history record and press "ESC" to exit. The numbers on the top right is the serial No. of the record and the numbers in the second line display date when faults occur and settled. If the color of the third line illuminates, the fault occurs, if not, the fault is solved.

5.4.3 Statistics

Press "∧" and "∨" in the main interface to select "Statistics", and then press "ENT" to view the parameters which is shown in figure 5.6.

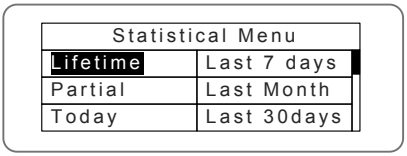


Figure 5.6 Statistic information

The information in table 5-3 can be viewed in the statistical menu.

Table 5-3 Statistic information

Content	Detailed
Lifetime	Total operation time, total power produced, total power saved, total CO_2 reduction in lifetime
Time statistics	Total power produced, total power saved, peak power and total CO_2 reduction in statistical time
Day statistics	Total power produced, total power saved, peak power and total CO_2 reduction in current day
Latest 7 days	Total power produced, total power saved and total CO_2 reduction in latest 7 days
Latest 1 month	Total power produced, total power saved and total CO_2 reduction in latest 1 month
Latest 30 days	Total power produced, total power saved and total CO_2 reduction in latest 30 days
Latest 1 year	Total power produced, total power saved and total CO_2 reduction in latest 1 year

5.4.4 Parameter settings

Press "∧" and "∨" in the main interface to select "Setup Menu", and then press "ENT" to view the parameters which is shown in figure 5.7.

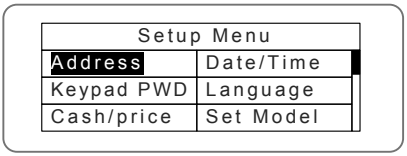
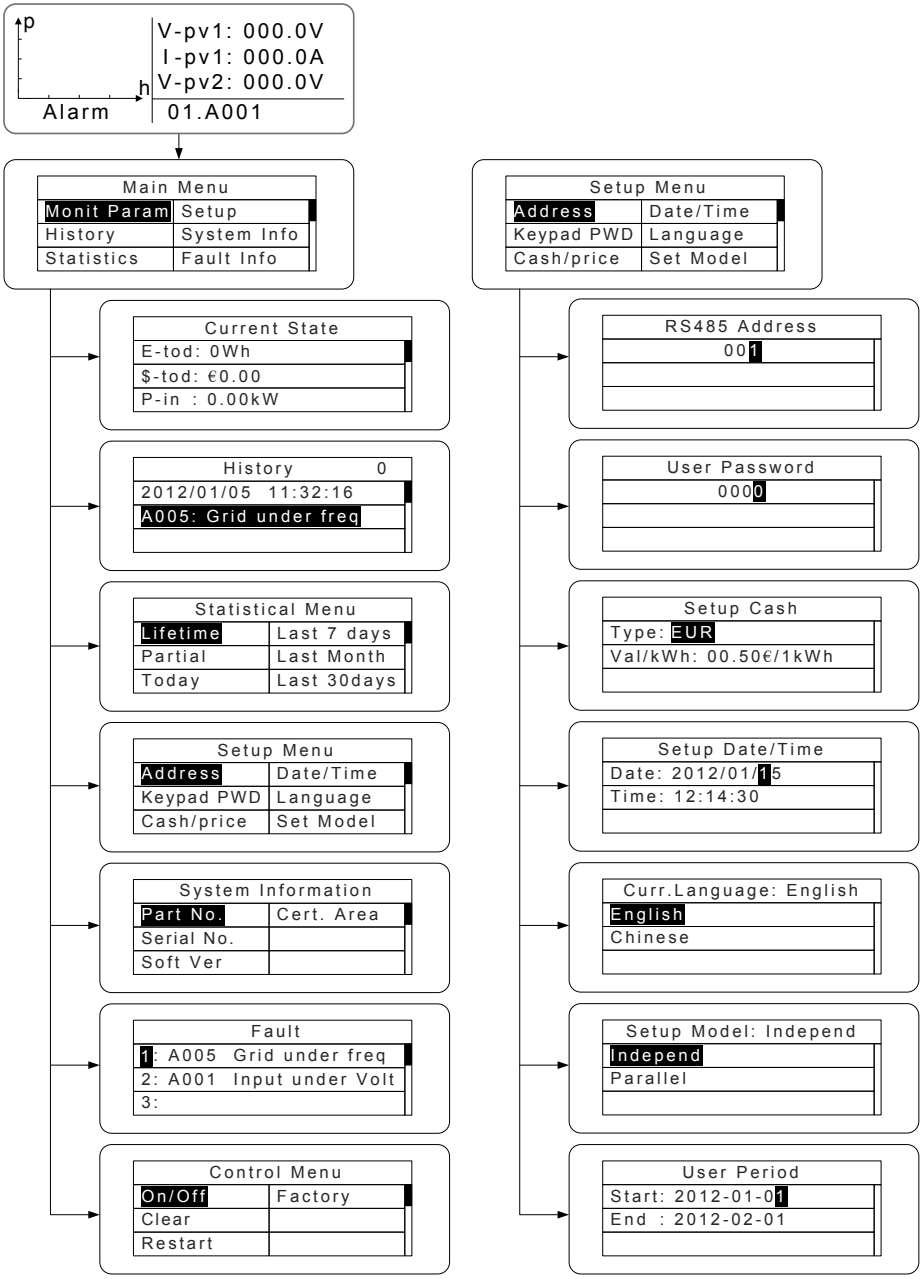


Figure 5.7 Setting information

Parameters can be set in this interface.

LCD menus:


P
h
Alarm
V-pv1: 000.0V
I-pv1: 000.0A
V-pv2: 000.0V
01.A001
Main Menu
Monit Param
Setup
History
System Info
Statistics
Fault Info
Setup Menu
Address
Date/Time
Keypad PWD
Language
Cash/price
Set Model
Current State
E-tod: 0Wh
$-tod: €0.00
P-in : 0.00kW
History 0
2012/01/05 11:32:16
A005: Grid under freq
Statistical Menu
Lifetime
Last 7 days
Partial
Last Month
Today
Last 30days
Setup Menu
Address
Date/Time
Keypad PWD
Language
Cash/price
Set Model
System Information
Part No.
Cert. Area
Serial No.
Soft Ver
Fault
1: A005 Grid under freq
2: A001 Input under Volt
3:
Control Menu
On/Off
Factory
Clear
Restart
RS485 Address
001
User Password
0000
Setup Cash
Type: EUR
Val/kWh: 00.50€/1kWh
Setup Date/Time
Date: 2012/01/15
Time: 12:14:30
Curr.Language: English
English
Chinese
Setup Model: Independ
Independ
Parallel
User Period
Start: 2012-01-01
End : 2012-02-01

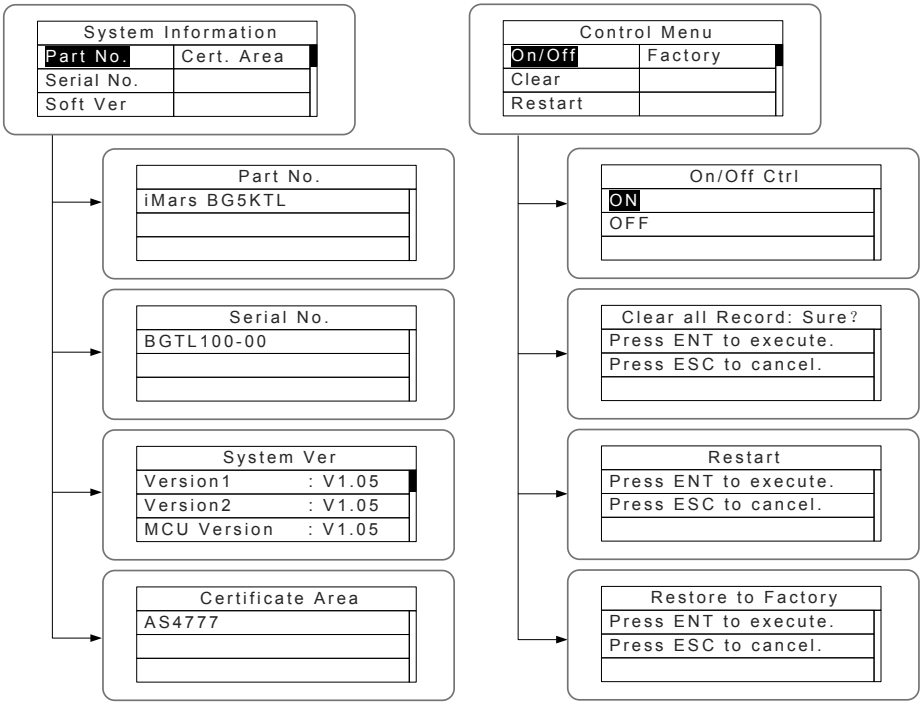
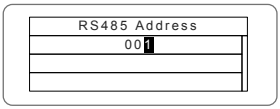
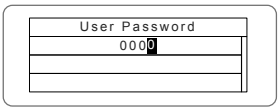
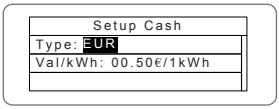
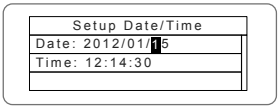
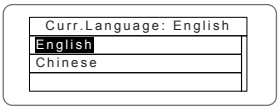
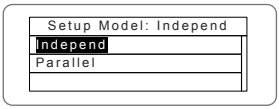
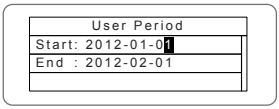


Table 5-4 Parameters setting

Setting item	LCD display	Instruction
RS485 Address		Enter into the interface and edit the data through "∧" or "∨". And then press "ENT" again to the next bit. After editing the three bits, press "ENT" to save the edition and press "ESC" to exit.
User password		Enter into the interface and edit the data through "∧" or "∨". And then press "ENT" again to the next bit. After editing the four bits, press "ENT" to save the edition and press "ESC" to exit. The default password is "0000"; the user can enter into the setting interface without password. If the password is not "0000", the user can enter into the setting interface with password.

Setting item	LCD display	Instruction
Setup Cash		Enter into the interface and edit the currency type and cash through "∧" or "∨". And then press "ENT" again to the next line. After editing the four bits, press "ENT" to save the edition and press "ESC" to exit. The currency types include EUR, POD, CNY and USD.
Setup Date/Time		Enter into the interface and edit the date and time through "∧" or "∨". And then press "ENT" again to the next line. After editing the four bits, press "ENT" to save the edition and press "ESC" to exit.，
Language		Enter into the interface and edit the language through "∧" or "∨". And then press "ENT" again to save the edition and press "ESC" to exit. The default language is English.
Setup mode		The DC input mode includes "independent" and "parallel": "independent mode" is the independent MPPT of Track A and Track B; "parallel mode" is the parallel MPPT of Track A and Track B. The default mode is "independent". The input mode setting is invisible if the inverter is in power generation. It is only available during DC power on and AC power off. Press "∧" or "∨" to select the setting mode and press "ENT" to save the setting or "ESC" to return. If the situation of section 5.4.8 occurs, it is necessary to switch the DC input to "parallel" mode.

Setting item	LCD display	Instruction
User period		Enter into the interface and edit the user period through "∧" or "∨". And then press "ENT" again to the next bit. After editing, press "ENT" to save the edition and press "ESC" to exit. Of which, the setting time and date needs to be later than the system setting, and the start time needs to be earlier than the end time. The setting date and time is used for the statistical information.

5.4.5 System Information

Press "∧" and "∨" in the main interface to select "System Information", and then press "ENT" to view the parameters which is shown in figure 5.8.

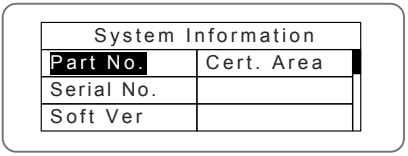


Figure 5.8 System information

The system information include "product model", "serial No.", "software version" and "certificate version".

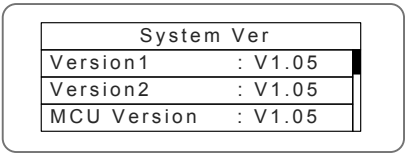


Figure 5.9 System version

5.4.6 Faults

Press "∧" and "∨" in the main interface to review the fault history, and then press "ENT" to view the sub-menu which is shown in figure 5.10.

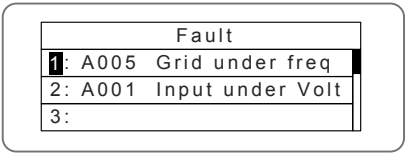


Figure 5.10 Fault information

There are 8 pieces of fault information in the record which is shown in figure 5.10; otherwise it will display “No Fault!” Refer to section 5.4.2 for more detailed information.

5.4.7 Inverter control

Press “∧” and “∨” in the control interface, and then press “ENT” to view the sub-menu which is shown in figure 5.11.

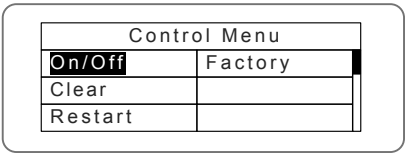


Figure 5.11 Control interface

Refer to the table below for detailed information.

Table 5-5 Inverter control

Control item	LCD display	Instruction
On/Off control	On/Off Ctrl ON OFF	Control the “On/Off” through the panel. Press “∧” and “∨” in the control interface to select the operation. Press “ENT” to ensure the operation and press “ESC” to return.
Restart	Restart Press ENT to execute. Press ESC to cancel.	Restart the inverter through the panel. And save the all settings and operation record. Press “ENT” to ensure restarting and the inverter will begin to self-inspect or press “ESC” to return.
Record clear	Clear all Record: Sure? Press ENT to execute. Press ESC to cancel.	Press “ENT” to ensure clear all records or press “ESC” to return. “Record clear” is to clear all setting parameters through the panel, restore to the factory setting and save all history

Control item	LCD display	Instruction
		operation records.
Restore to factory	Restore to Factory Press ENT to execute. Press ESC to cancel.	“Restore to factory” is to clear all setting parameters and history operation records through the panel, restore to the factory setting. Press “ENT” to ensure clear or press “ESC” to return.

5.4.8 Mode settings

The default mode of series grid-tied solar inverters is “independent”. But if the current of solar modules are joined into the inverter as figure 5.12 shows, it is necessary to switch the mode into “parallel”.

Except the inverters BG4KTL / BG5KTL / BG6KTL / BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR, the inverters of BG1K5TL / BG2K2TL / BG3KTL are without input mode setting. Please refer to section 5.4.4 for detailed setting.

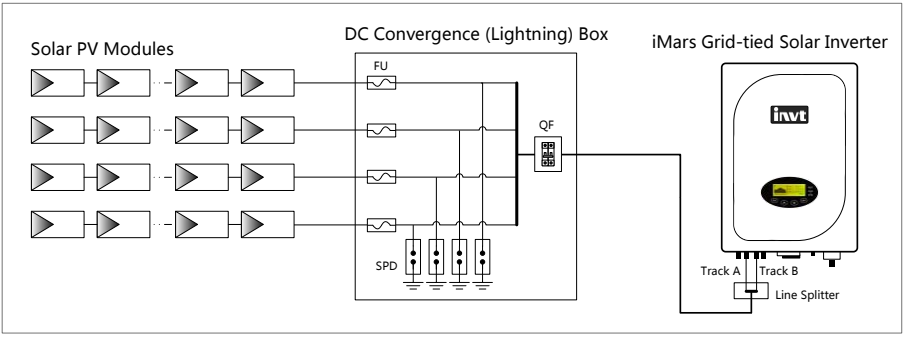


Figure 5.12 “Parallel” input mode

6 Monitoring communication

This chapter describes the communication connection of inverter and monitoring system (Industrial master, private computers, smart phones and so on).

The standard communication mode of iMars B series grid-tied solar inverters is RS485 which includes “RS485” and “EXT” ports. “RS485” communication port is mainly for the industrial master with serial communication; “EXT” communication port is especially for the optional communication mode and mainly used for the monitoring of private computers and smart phones to the inverter operation. The system monitoring solution of iMars B series grid-tied solar inverters are shown as figure 6.1.

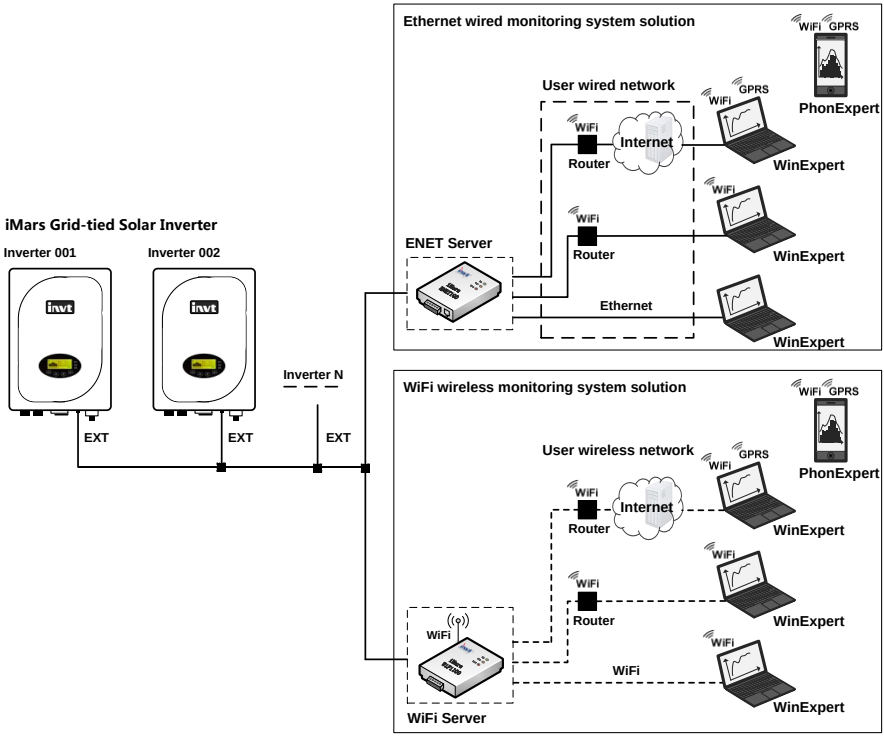


Figure 6.1 Monitoring system of inverters

6.1 Standard communication

The standard communication mode of iMars B series grid-tied solar inverters is RS485 and the communication port of the monitoring system is RS485.

Connection steps:

(1) Dismantle the configured communication connector as figure 6.2 shows:

Table 6-1 Connector instruction

Pin	Definition
1	
2	A(RS485+)
3	B(RS485-)
4	

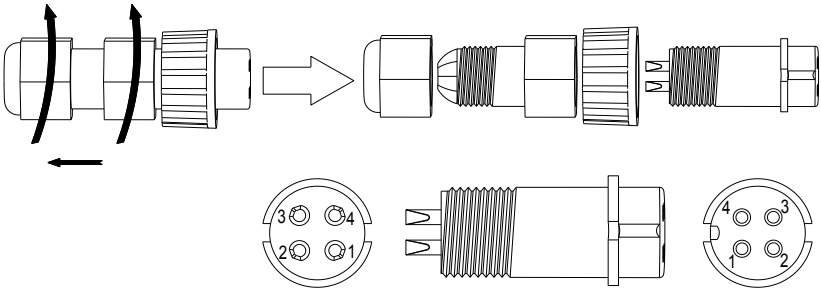


Figure 6.2 Communication connector

(2) Weld communication cables to the corresponding pin of the connector with electric iron. Ensure the cable corresponds to the pin as table 6-1 shows and the welding is tight enough.

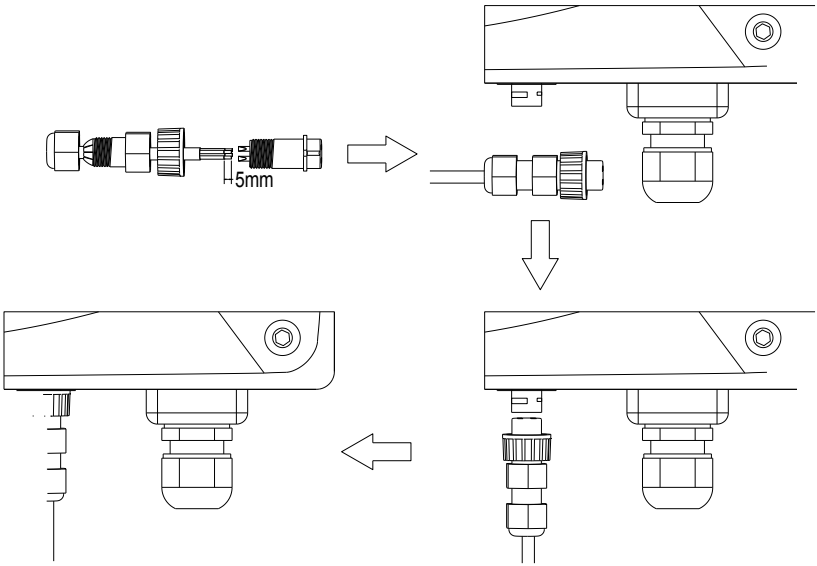


Figure 6.3 Detailed connection

(3) Connect the communication connector to the inverter as figure 6.3 shows.

(4) Please download the monitoring software “iMars WinExpert” and its operation instruction on www.invt-solar.com.

6.2 Optional communication

The optional communication modes include Ethernet, WiFi, which also need corresponding communication parts and components. All operation parameters of the inverter are output from port “EXT”, and then to the communication devices, finally after convertering, to the monitoring system of upper PC as standard Ethernet, WiFi signal. See figure 6.1.

Table 6-2 Optional accessories

Optional accessories	Inverter port	Port of upper PC
Ethernet converter	EXT	RJ45 plug
WiFi converter	EXT	WiFi signal

Please download the connection instruction, operation manual and commissioning tools on website www.invt-solar.com.

Note: the optional accessories are not standard-configured.

7 Troubleshooting

This chapter describes the fault alarm and fault code for quick troubleshooting.

Table 7-1 Fault code

Fault code	Message	Instruction	Fault analysis
A			
A001	Input UV	Input undervoltage	PV1 undervoltage PV2 undervoltage
A002	Bus UV	Bus undervoltage	DC input
A003	Grid UV	AC undervoltage	Low voltage of the public grid
A004	Grid OV	AC overvoltage	High voltage of the public grid
A005	Grid UF	AC underfrequency	Low frequency of the public grid
A006	Grid OF	AC overfrequency	High frequency of the public grid
A007	Clock Fail	Clock alarm	Wrong setting
A008	Impedance	High grid impedance	High grid impedance
A009	Cmd Shut	Manual stutdown	Stop by the operation panel or upper PC
E			
E001	Input OV	Input overvoltage	DC input overvoltage
E003	Bus OV	Bus overvoltage	Internal bus voltage
E004	Boost Fail	Voltage-boost fault	Voltage-boost fault of the inverter
E005	Grid OC	AC overcurrent	Internal AC overcurrent
E006	OTP	Overtemperature	Internal overtemperature
E007	Riso Low	Low isolation impedance	Low isolation impedance of the external port system
E008	IGBT drv	IGBT drive protection	IGBT drive protection of the inverter
E009	Int Comm	Internal communication fault	Master-slave DSP communication disabled Error of master-slave DSP check bit
E010	ILeek Fail	Huge leakage current	Huge leakage current of the system or inverter
E011	Relay Fault	Relay fault	Internal relay fault
E012	Fan Fail	Fan fault	Internal fan fault
E013	Eeprom	Memory error	Internal memory error
E014	Dc inject	High DC injection	High DC injection during AC output
E015	OutputShort	Output short-circuit	Output short-circuit
E016	Zero Drift	Zero drift	Zero drift of AC voltage and current measurement

Fault code	Message	Instruction	Fault analysis
E017	Gridnegat.phase	Reverse grid phase	Reverse grid phase
E018	Input OC	Input overcurrent	DC input overcurrent
E019	Incnst	Data consistency fault	Inconsistent grid voltage, frequency, leakage current or AC/DC injection
E020	PowerReversed	DC power reversed	DC power reversed
	Running	No faults and alarms	No faults and alarms

If any problem, please contact with the supplier and provide following information:

- Model of the inverter:_____;
- Serial No. of the inverter:_____;
- System version:——version 1: _____;
  ——version 2: _____;
  ——MCU software version: _____;
- Fault code:_____;
- Fault description:_____.

8 Contact us

Shenzhen·China

SHENZHEN INVT ELECTRIC CO., LTD

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Tel: +86 755 86312953

Email: invtsolaros@invt.com.cn; invtsolarcn@invt.com.cn

Website: www.invt.com

Solar website:www.invt-solar.com

Warranty Card

iMars B series inverters		2012
Consumer information (please print):		
Name:	Business name:	
Address:	Phone Number:	
City:	State:	Zip Code:
Email:		
Installer information:		
Installer name:		
Installation Company:		
Contractor's license number:		
Address:		
City:	State:	Zip Code:
Email:		
Website:		
Modules used:		
Modules per string:		
Number of strings:		
System commission date:		
Fault inverter information:		
Model No.:	Serial No.:	Date of Delivery:
Error Code:	Error tips:	
Version1:	Version2:	MCU Version:
Fault Messages: Signature:		

Please mail or email a copy of this warranty registration card to:

Address：4# Building, Gaofa Industrial Park, Longjing, Nanshan District, Shenzhen, China 518055
Tel：86-755-86312953 Fax：86-755-86312880
Website：www.invt.com Email：inverter@invt.com.cn

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INVT Warranty Terms and Conditions

INVT inverter provides five years' quality assurance

*Please keep the whole warranty card and purchase invoice as the basis for quality assurance *

- **Standard warranty：**

iMars BG Series inverters (Model: BG1K5TL / BG2K2TL / BG3KTL / BG4KTL / BG5KTL / BG6KTL / BG6KTR / BG8KTR / BG10KTR / BG12KTR / BG15KTR) from Shenzhen INVT Electric Co., Ltd. (herein after "INVT"). Have 60 months standard warranty period starting on the date of Shipment by INVT.

- **Warranty extension：**

The warranty period can be extended to 10 years from the date of shipment or no more than 126 months from the date of delivery by INVT, subject to additional cost. INVT also offers warranty extensions to 15 and 20 years (please check the separate order form). The warranty extension can be ordered while orders be confirmed and before shipment, and no more than twelve months after delivery by INVT. Warranty extension is no longer possible after the above-mentioned dates. Upon purchase of the warranty extension and once the unit has been delivered, INVT grants the customer a warranty certificate for each inverter confirming the extended warranty period.

- **Procedure in the case of servicing：**

Contact INVT or the authorized service agencies if your product is in the course of a defect or fault during the warranty period. To file warranty claims and for claim management with INVT, you are required to supply us with following information and documents regarding the fault inverter:

- Copy of the invoice and warranty certificate for the inverter.
- Copy of the startup report and startup date.
- Copy of warranty card (already filled out).
- Documentation detailing previous claims/exchanges (if applicable).

If a device becomes defective or fault during the specified INVT Factory warranty period, one of the following services, as selected by INVT.

1) Depot Repair（For iMars B Series inverters）.
2) Exchange for a replacement device of equivalent value according to model and age（Only for iMars B Series inverters）. In this case, the reminder of the warranty entitlement will be transferred to the replacement device. In such an event, you do not receive a new warranty card, as your entitlement is documented at INVT. INVT or the authorized service agencies will inform replacement date within 2 working days. The defective device is to be packed in the original packaging materials for return transport to the closest office of INVT.

- **Exclusion of warranty claims:**

To provide better service to INVT's End Users, all INVT authorized Dealers or Distributors are requested to respond to End Users' warranty claim, and INVT will replace any products or parts of the product during the Warranty Period proved to be defective in design or manufacture, provided always that the INVT's obligations stated below will not apply where (the Dealers or Distributors are liable for investigation of the following):

1) "Warranty Card" not being sent back to Distributor/Dealer or INVT;
2) Failure to observe the user manual, the installation guide, and the maintenance regulations;
3) Product modified or design changed or parts replaced not approved by INVT;
4) Transport damage, Painting scratch caused by shipping pumping, it should claim to insurance company as soon as containers unload with enough evidence;
5) Modifications, changes, or attempted repairs and erase series number or seals by non INVT's technician;
6) Failure to observe the applicable safety regulations (VDE standards, etc.);
7) Incorrect installation or commissioning;
8) The Product has been improperly stored and damaged while being stored by the Dealer or the end user;
9) Insufficient ventilation of the device;
10) The maintenance procedures relating to such product have not been observed or performed to an acceptable standard;
11) Incorrect use or inappropriate operation;
12) Force majeure (e.g., lightning, overvoltage, storm, fire).

Only INVT has the rights to revise the quality assurance contents mentioned-above; any trader or distributor has no rights to make any modification for warranty card provided by INVT, or represent INVT to express any opinion and behavior; INVT reserves the final interpretation right. If there is any question, users can dial the after-sales hotline.

Shenzhen INVT Electric Co., Ltd.

Quality certification

Inspector:_____

This product has passed inspection of our quality control and assurance department, and its performance parameters meet the "User Manual" standard. Allowed to ex-factory sales!

Shenzhen INVT Electric Co., Ltd.

Service line:86-755-86312953 E-mail:invtsolaros@invt.com.cn Website:www.invt.com

SHENZHEN INVT ELECTRIC CO., LTD. No. 4 Building, Gaofa Scientific Industrial Park, Longjing, Nanshan District, Shenzhen, China

Electric Drive: ■ Frequency Inverter ■ Traction Drive ■ Intelligent Elevator Control System

Industrial Control: ■ Servo & Motion Control ■ Motor & Electric Spindle ■ PLC ■ HMI

New Energy: ■ SVG ■ Solar Inverter ■ UPS ■ Online Energy Management System

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